uc3m | Universidad **Carlos III** de Madrid

Survey Sampling

Academic Year: (2023 / 2024)   **Review date: 26-04-2023**

Department assigned to the subject: Statistics Department

Coordinating teacher: MARIN DIAZARAQUE, JUAN MIGUEL

Type: Compulsory ECTS Credits : 6.0

Year : 3 Semester : 2

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Probability , Probability II
Elementary Statistical Theory I, Elementary Statistical Theory II

OBJECTIVES

General objectives:
1. Capacity for analysis and synthesis.
2. To model and solve problems.
3. Oral and written communication skills.

Specific objectives:
1. Knowledge, both in theory and practice, of the foundations of the main techniques of survey sampling.
2. Differentiation of the different types of sampling.
3. Ability to make inference in finite populations under complex sampling designs.

DESCRIPTION OF CONTENTS: PROGRAMME

The course is an introduction to the basic concepts and methods of
Survey Sampling.

1. Introduction.

2. Simple random sampling.
    2.1. Description
    2.2. Inference under the design

3. Stratified random sampling.
    3.1. Description
    3.2. Inference under the design

4. Ratio, regression and difference estimators.
    4.1. Estimators
    4.2. Sampling error

5. Systematic sampling.
    5.1. Description
    5.2. Inference under the design

6. Cluster sampling.
    6.1. Description
    6.2. Inference under the design

LEARNING ACTIVITIES AND METHODOLOGY

Competences will be acquired by students both through theoretical lectures and the resolution of assigned
homeworks. There will also be practical classes of exercises.

ASSESSMENT SYSTEM

Continuous evaluation (60%): Applied project based on a data set from INE (40%) and midterm exam (20%).
Examen final (40%): Final exam with theory and exercises.

% end-of-term-examination: 40

% of continuous assessment (assigments, laboratory, practicals…):   60

BASIC BIBLIOGRAPHY

- Cochran, W. Sampling Techniques, 3rd Edition, John Wiley., 1977

- Lohr, S. Sampling: Design and Analysis, Duxbury, 1999

- Scheaffer, R.L., Mendenhall, W., Ott, L. and Gerow, K.G. Elementary Survey Sampling, Cengage Learning, Inc, 2010
- Tillé, Y. Sampling Algorithms, Springer, 2002

ADDITIONAL BIBLIOGRAPHY

- SCHEAFFER, R.L., MENDENHALL, W. and OTT, L. (2005) Elementary Survey Sampling, 6th Edition., Duxbury Advanced Series..
- Sarndal, C.-E., Swensson, B. and Wretman, J. Model Assisted Survey Sampling, Springer, 1992